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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,073	03/25/2004	Christopher Parks	87135PCW	6988

7590 07/15/2008  
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EXAMINER
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WANG, KENT F

ART UNIT	PAPER NUMBER
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2622

MAIL DATE	DELIVERY MODE
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07/15/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/809,073	<b>Applicant(s)</b> PARKS, CHRISTOPHER	
	<b>Examiner</b> KENT WANG	<b>Art Unit</b> 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10, 12 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10, 12 and 14-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The pre-brief conference request, filed on 04/14/2008, have been entered and made of record. Claims 10, 12, 14-22 are pending.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 10, 12, and 14-22 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 10, 12, 14-15, 17, and 19-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Komiya (US 5,335,075) in view of Sayag (US 5,055,667), and further in view of Bryant (US 6,249,358).

Regarding claim 10, Komiya discloses a camera (an electronic camera) comprising an image sensor (a charge modulation device CMD 39, Fig 20) comprising a plurality of pixels in which at least two or more pixels have a charge control structure (condition setting circuit 64, Fig 20) used to change charge capacity during an integration time (col. 12, lines 27-54);

Komiya does not disclose at substantially a beginning of the integration time the charge capacity is altered to substantially zero by either the charge control structure

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or a read-out mechanism and the charge capacity is changed by the charge control structure throughout the integration time such that substantially no portion of the pixel photo response curve is substantially linear. However, Sayag discloses at substantially a beginning of the integration time the charge capacity is altered to substantially zero (straight line 42 is tangent to the curve 41 at the origin) by either the charge control structure (line 42 represents the charge accumulation curve for a predetermined constant incident light intensity IO) and the charge capacity is changed by the charge control structure throughout the integration time such that substantially no portion of the pixel photo response curve is substantially linear (as the curve 41 of Fig 4 represents the maximum acceptable charge desired to be accumulated in the photogate region at any fraction of the integration period and a varying potential is applied to integration control gate 23 such that the charge in the photogate accumulates at the maximum permissible rate, i.e., along curve 41 in Fig 4) (col. 5, line 10 to col. 6, line 10, Sayag).

Komiya does not disclose means for multiplying each pixel by a constant value determined for that pixel to compensate for variations of the charge capacity such that all pixel photo response curves are substantially equal. However, Bryant discloses means for multiplying each pixel by a constant value determined for that pixel to compensate for variations of the charge capacity such that all pixel photo response curves are substantially equal (the multiplication for each pixel of the offset corrected scan data on line 29a with its associated gain from table 20 will equal one for every pixel, and the resulting system response will be uniform) (col. 4, line 56 to col. 5, line 33, Bryant).

Komiya, Sayag and Bryant are analogous art because they are from the same field of having an image sensing apparatus with exposure level and dynamic range control circuit. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the non-linear photosite response as taught by Sayag, so as the function of maximum acceptable charge level can be mathematically determined and electronically generated on the chip so as to achieve a compression of the dynamic range in an arbitrarily chosen manner, thus the potential at the output of the device is directly proportional to the charge transferred to the transport gate (col. 5, lines 10-35 and col. 7, lines 19-23, Sayag).

And at the time of the invention, it would have been further obvious to a person of the ordinary skill in the art to use Bryant's selectively determined system in Komiya's image sensor device. The suggestion/motivation would have been to enable the pixel to pixel variations together combine to create a system response which may be measured and compensated by applying offsets to correct for variations in dark signal level and gains to correct for variations in illumination and pixel responsiveness (col. 4, line 56 to col. 5, line 9, Bryant).

Regarding claim 12, Komiya discloses the charge capacity control structure (condition setting circuit 64, Fig 20) is pulsed so as to substantially reproduce the photo response curve (when time  $t_2$  has passed, the signal is read out and reset is performed) (col. 14, line 67 to col. 15, line 10).

Regarding claim 14, Komiya discloses a look up table ("five readouts are performed when data accumulated at the accumulator" gave implicit that a table is inherent in the system) to translate the photo response curve into linear space for

color filter processing (nonlinear accumulation data  $F_0$  is converted to be linear as shown by  $F_1$  in Fig 22) (col. 15, lines 21-41).

Regarding claim 15, Komiya discloses the constant values are stored in a digital camera (for mode B of photographing mode, the number of accumulations is kept at a constant value  $n_C$ ) (col. 9, line 55 to col. 10, line 12).

Regarding claim 17, Komiya discloses the image sensor (a charge modulation device CMD 39, Fig 20) is disposed in a digital camera that includes a mechanism (linear conversion circuit 88) to switch between linear and nonlinear photo response (nonlinear accumulation data  $F_0$  is converted to be linear as shown by  $F_1$  in Fig 22) (col. 15, lines 21-41).

Regarding claim 19, this claim differs from claim 10 only in that the claim 10 is an apparatus claim whereas claim 19 is a method. Thus the method claim 19 is analyzed and rejected as previously discussed with respect to claim 10 above.

Regarding claims 20, 21, and 22, these claims recite same limitations as claims 14, 12, and 15, respectively. Thus they are analyzed and rejected as previously discussed with respect to claims 14, 12, and 15 above.

5. Claims 16 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Komiya in view of Sayag and Bryant, and further in view of Juen, US 5,341,220.

Regarding claim 16, the limitations of claim 10 are taught above, Komiya, Sayag, and Bryant disclose an image sensor comprising a charge control structure used to change charge capacity during the integration time. Komiya does not disclose the capacity control structure is adjusted to produce the desired photo response curve substantially entirely within the duration of a flash lamp exposure.

Juen discloses the capacity control structure (vertical overflow drain structure) which is adjusted to produce the desired photo response curve substantially entirely within the duration of a flash lamp exposure (flash light unit 13 is made ready to emit light) (col. 8, line 64 to col. 9, line 13, Juen).

Komiya, Sayag, Bryant and Juen are analogous art because they are from the same field of time integrating image sensors. At the time of the invention, it would have been obvious to a person of the ordinary skill in the art to choose Juen's flash light unit. The suggestion/motivation would have been to enable the system to provide an auxiliary illumination in case of need during the entire duration of flash lamp exposure (col. 5, lines 16-21, Juen).

Regarding claim 18, the limitations of claim 10 are taught above, the Komiya, Sayag, and Bryant references do not specifically teach that CCD in which images are substantially read out of a vertical CCD before starting the integration in photodiodes of any next images. However Juen does teach the image sensor as a CCD in which images are substantially read out of a vertical CCD (vertical transfer register 44, Figs 4-5) before starting the integration in photodiodes of any next images (col. 13, lines 24-37, Juen).

Thus, it would have been obvious to one of ordinary skill in the art to have included the image sensor as taught by Juen, as to make it possible to accurately measure only the very small photo current flowing out from the photoelectric charge storage layer (col. 13, lines 52-59, Juen).

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Kawakami (US 2004/0263678), Kameyama (US 6,111,607), Compton et al. (US 2005/0195296), Capitant et al. (US 5,185,666), and Lovette et al. (US 7,064,781).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kent Wang whose telephone number is 571-270-1703. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc Yen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-270-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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KW

11 June 2007

*/Ngoc-Yen T. VU/  
Supervisory Patent Examiner, Art Unit 2622*